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FIFTY-FIFTH
Annual Report
AND YEARBOOK
1946

General Electric Company

GENERAL ELECTRIC

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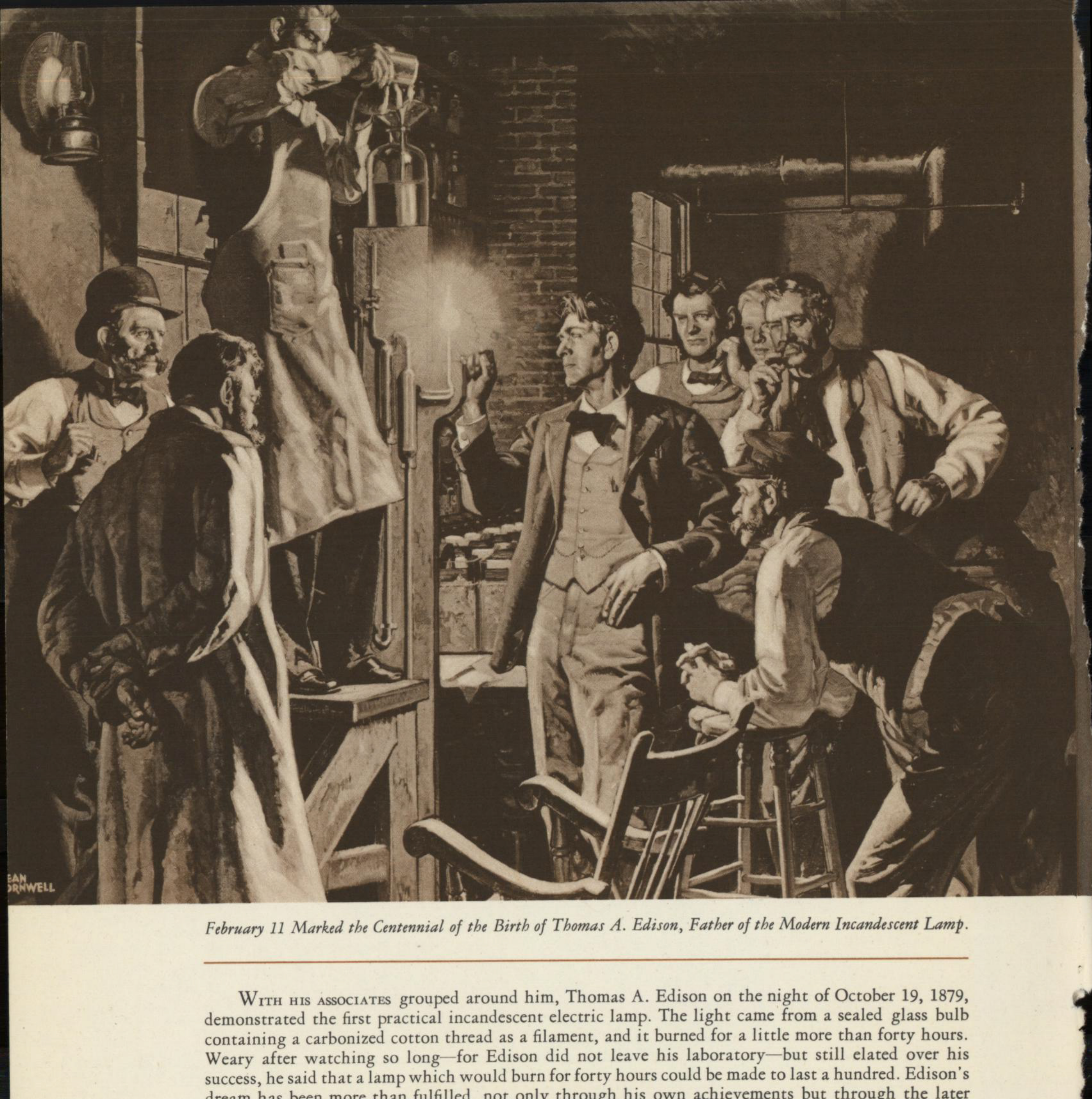

February 11 Marked the Centennial of the Birth of Thomas A. Edison, Father of the Modern Incandescent Lamp.

With his associates grouped around him, Thomas A. Edison on the night of October 19, 1879, demonstrated the first practical incandescent electric lamp. The light came from a sealed glass bulb containing a carbonized cotton thread as a filament, and it burned for a little more than forty hours. Weary after watching so long—for Edison did not leave his laboratory—but still elated over his success, he said that a lamp which would burn for forty hours could be made to last a hundred. Edison's dream has been more than fulfilled, not only through his own achievements but through the later developments of Whitney, Coolidge, Langmuir, as well as others from the Lamp Laboratory—monumental names in the development of lighting and names firmly identified with General Electric.

General Electric has contributed a hundred major developments, and a thousand improvements, to electric lighting. As advance followed advance, as the demand for more lights and brighter lights increased, the cost of lamps declined correspondingly. A 60-watt lamp which sold for $1.75 in 1907 sells today for 11 cents. But a comparison of cost alone is inadequate. Today's lamp is incomparably brighter, lasts longer. Into few other electrical products have gone more research and engineering. No other product better exemplifies the slogan: More goods for more people at less cost.

GENERAL ELECTRIC
COMPANY

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ORGANIZATION CHANGES

William C. Dickerman, a Director, died April 25, 1946, and the following minute was adopted by the Board on May 3:

> *William C. Dickerman died on April 25, 1946. He was elected to membership on this Board April 28, 1944. While Mr. Dickerman had been a member of this Board for a comparatively brief period, he showed the keenest interest in the problems coming before it and made available to it his wisdom and long experience as an executive in the transportation field where he was active as a leader of men for almost fifty years.*
>
> *In testimony of our admiration and affection for him, this minute is included in our records.*

Clark H. Minor, who had previously retired as President of International General Electric Company, Inc., retired from the Board of your Company on July 9, 1946.

Pursuant to the by-laws, and by action of the Board, the number of Directors was increased from 16 to 18 during 1946.

Two new Directors, Edward R. Stettinius, Jr. and Robert T. Stevens, were elected on September 27, 1946. Mr. Stettinius, formerly Secretary of State, is Rector of the University of Virginia, and Mr. Stevens is Chairman of the Board of Directors of J. P. Stevens & Co., Inc.

John G. Farrar, Comptroller since 1944, resigned from this position as of September 27 because of ill health and, after more than 33 years of loyal service, has retired under the provisions of the Company Pension Plan.

Donald L. Millham, formerly Assistant Comptroller in charge of corporate accounts and tax matters, was elected Comptroller of the Company on September 27, 1946, to succeed Mr. Farrar.

Charles K. West, Commercial Vice President in the Atlantic district, retired under the Company Pension Plan on July 1, 1946, after more than 47 years of loyal service.

Orville F. Haas, formerly District Manager for the Lamp Department in the same territory, was elected a Commercial Vice President on June 28, 1946, to succeed Mr. West.

To the Stockholders of the *Schenectady*, N. Y., *March* 22, 1947
General Electric Company:

The year 1946 appears to have marked a new high in perplexity and paradox for American business management and for the consuming public generally.

A Year of Paradoxes

Although most manufacturing companies were favored with an unprecedented demand for goods and services of all kinds, with expanded plant facilities and adequate manpower, and with an unexpected acceleration in the relinquishment of governmental controls, many of them found that these advantages were diminished and often nullified by the succession of strikes which resulted in critical shortages of raw materials and component parts, increased production costs and prices, and greatly reduced operating margins or substantial operating losses. In 1946, idleness due to work stoppages throughout the nation reached an all-time high of 113,000,000 man-days, according to an estimate of the Bureau of Labor Statistics, U. S. Department of Labor.

A full report of the strike called by the United Electrical, Radio and Machine Workers Union, which closed General Electric plants for nine weeks in the first quarter of 1946, already has been made to stockholders. Not only did your Company suffer from the closing of its own plants, but strikes in basic industries and in the plants of its suppliers adversely affected its operations. Shortages of steel, copper, and pig iron, of textiles and lumber, of coke and chemicals, greatly hampered the Company in meeting its objectives in the manufacture of many products.

Material Shortages

When it is realized that for each dollar of Company sales between 30 and 40 cents is spent for materials, the job of procuring such items in a year like 1946 can be viewed in its proper light. Although the Company's efforts to secure adequate supplies of raw materials and parts were comparatively successful, at no time during the year was it possible to obtain all of them in quantities sufficient to maintain planned schedules or to meet consumer demand. So serious, indeed, were the shortages at times it was necessary to close, temporarily, a number of divisions.

Although strikes in various industries were a principal factor, there were other causes for the shortages. During the war it was necessary for the steel industry to turn to production of steel for heavy forgings, castings, ship plates, etc. As a consequence there is not much more capacity, if any, today for steel sheets than in 1941, and a substantial part of the sheet steel available went, as a result of government direction, into housing and food pack, and for export. These sheets are essential to the production of many General Electric products. An estimated 21 per cent less copper was available to American industry in 1946 than in 1941; domestic productive capacity was inadequate and the foreign supply was restricted both by the U.S. price ceiling and the fact that no one but the government could purchase it. Pig lead, which is used extensively in making wire and cable, was not only in short supply but its use was restricted by the government; a quota system was set up for manufacturers of cable, and as a result the largest of your Company's wire and cable facilities was limited to two thirds of the quantity needed.

From the foregoing it should not be inferred that General Electric failed as regards its production during 1946. On the contrary, there were numerous instances in which output was obtained over extended periods at rates never previously achieved, and shipments billed for the year were more than 60 per cent greater than in any year prior to 1941. But its customers, having heard such reports, were naturally confused to find they were either unable to purchase certain products at all or were required to wait many weeks for deliveries. The explanation was simple —even the expanded production was insufficient to meet the full needs of the public.

Prices and Wages

Ever since peacetime operations were resumed it has been General Electric's objective to get a maximum quantity of its products manufactured, distributed and sold with a minimum delay. It has also continued its long-established policy of selling its products at the lowest possible prices consistent with the yield of a reasonable profit—as indicated by the fact that on a weighted average basis the selling prices of all General Electric products at the turn of the year were only 27 per cent greater than in 1940, the last full year of peacetime production. In contrast, the U.S. Bureau of Labor index of the price of manufactured products showed an increase of approximately 65 per cent during the same period.

When General Electric resumed peacetime production in 1945 its prices were only an estimated two or three per cent higher than in 1940 and they remained substantially unchanged throughout most of the first quarter of 1946. The price relief granted by the Office of Price Administration was inadequate and was delayed until long after its need became apparent; also the increases announced following discontinuance of OPA were made solely on the basis of their essentiality. Because the major portion of these price changes came so late in the year, they had relatively little effect on your Company's operating results for 1946.

Accordingly, during the last nine months of the year, General Electric's operating margins were sufficient only to approximately offset the substantial first quarter operating loss resulting from the strike. Its net income for the year, therefore, resulted from refunds of prior years' Federal taxes due to the excess profits credit carry-back provisions of the Internal Revenue Code, from sundry income, and from restorations to income of amounts set aside out of prior years' earnings in a Reserve for Postwar Adjustments and Contingencies.

At this point it seems appropriate to call attention to the very close relationship which exists between prices and wages. In your Company, and in the electrical manufacturing industry generally, a very substantial portion of the cost of items purchased as "materials and component parts" also represents "labor" cost, indirectly, in the form of wages paid by others at every stage of processing of the items from the mine to the factory where they become finished products. Thus, as the general level of wages increases, your Company is affected not only by the increases it grants to its own employees but by the resulting increased costs of its materials and parts. Based upon output and conditions existing in December, 1946, your management estimated that for each one per cent increase in the general level of industrial payrolls, General Electric prices would have to be increased by at least three quarters of one per cent in order to maintain the rates of margin included in current selling prices.

The management of your Company believes that further general wage increases should be postponed until such time as all-out production effort on the part of employees, together with the full application of technological developments resulting from war experience, puts American industry in a position to begin again to *decrease* the prices of its goods and services to the consuming public, with resulting maximum advantage to the greatest number of people in the nation.

Financing

At the annual meeting of the stockholders on July 9, 1946, it was announced that lines of credit had been established with the Company's depository banks, against which up to $100,000,000 could be borrowed if needed. In September and October, 1946, $100,000,000 was borrowed against these lines of credit for one year, with the right of prepayment, at interest rates of from 1¼ to 1½ per cent.

Later in the year, the Company completed a long-range financing program, in the amount of $200,000,000. Under this program, on December 2, 1946, $150,000,000 was borrowed for 20 years from a group of 11 insurance companies and three trustees, and on December 3, 1946, $50,000,000 was borrowed from the Company's depository banks for a five-year period. The $100,000,000 of one-year loans, referred to above, was repaid on December 2, 1946, and the balance of $100,000,000 was added to the general funds of the Company.

The twenty-year loans bear an interest rate of 2.55 per cent and have provisions for amortization, beginning in 1953, and prepayment in whole or in part at any time upon not less than 60 nor more than 90 days' notice. The five-year loans bear an interest rate of 1.625 per cent and can be prepaid in whole or in part at any time upon 30 days' notice.

Heretofore your Company has supplied the funds necessary for the operation and expansion of its affiliated companies. In 1946 arrangements were made whereby the General Electric Supply Corporation, a wholly-owned affiliate, is financing its own requirements, as described in footnotes to the financial statements on page 18.

The additional working capital thus made available to your Company was needed because of the increasing volume of its business, losses resulting from the nine-week strike, and for its plant modernization and expansion program which is outlined below.

Plant Expansion

An indication of the scope of the Company's program for the expansion of plant capacity, reconversion, and rehabilitation was given in the last Annual Report, and from time to time announcements have been made of specific plants being built, planned, or leased.

If this program, which was started in 1945, is completed on the basis presently contemplated, General Electric will have added approximately $300,000,000 to its plant account, will have half again as much manufacturing space, and will require twice as many employees, as in prewar years. Where feasible, the policy of decentralization has been followed in recognition of the social and economic benefits to employees resulting therefrom.

The largest single plant now planned by the Company is a $20,000,000 structure to be built by the Apparatus Department at Schenectady for the manufacture of steam turbines and electric generators. This plant will cover approximately 19 acres and will require a minimum of 20 months to complete and another six to nine months to equip. The new plant will permit the concentration of construction of the larger types of turbines and generators in a single structure.

The Apparatus Department, in addition to its long-term forecast of increased requirements for power-generation equipment, contemplates a greater demand for fractional-horsepower motors, wire and cable, ballasts for fluorescent lamps, meters, time switches, transformers, and other of its products, and additional manufacturing space has been provided or is planned to increase the output.

Expansion by Departments

To meet a greatly expanded need for fluorescent lamp ballasts, production is under way in new plants at Danville and Benton, Ill., and Clyde, N. Y., in addition to Fort Wayne, Ind. Still more fractional-horsepower motors are being manufactured at new plants in Fort Wayne, Decatur, and Kokomo, Ind., Tiffin, Ohio, and DeKalb, Ill. Output of small turbines and welding sets has been stepped up by purchase of a new plant at Fitchburg, Mass., and the lease of a plant in Holyoke, Mass., has increased production of distribution and welding transformers. Facilities have also been expanded on the West Coast. A plant at Oakland, Calif., purchased during the war, is being equipped to manufacture commercial wire and cable and fluorescent lamp ballasts, and a plant was leased at San Jose, Calif., to increase the production of motors.

The Air Conditioning Department was given much-needed additional plant space at Bloomfield, N. J., by transfer during the year of the manufacturing of industrial control equipment to the Schenectady plant. This consolidated the manufacture of such equipment at Schenectady. The additional space acquired by the Air Conditioning Department, however, was not sufficient to meet its full requirements. Part of the Department's manufacturing is done at Fort Wayne, and it was found necessary also to add to those facilities.

As the year closed, Electronics Park, at Syracuse, N. Y., was nearing completion. Construction on this $25,000,000 research, engineering, and manufacturing center was started in 1945 and upon its completion radio and television transmitters and receivers, radio and radar equipment for the Army and Navy, and many other special products and devices of the Department will be manufactured at Syracuse. This Department also operates plants at 11 other locations, including eight not utilized before the war.

Facilities of the Appliance and Merchandise Department were greatly expanded in an effort to meet the public's demand for its products. On Nov. 1, 1946, the Department was operating 20 plants, including 16 not operated before the war. The production rate of the Department's products has been stepped up tremendously.

The Lamp Department has added almost half a million square feet of space to its facilities in localities in Ohio and Kentucky. These additions will increase production of photoflash lamps, fluorescent lamps, tungsten wire, glass for sealed beam lamps and the lamps themselves. Additional facilities are to be acquired to increase the output of Slimline fluorescent lamps and miniature lamps.

The Chemical Department has acquired three additional plants. They are situated at Anaheim, Calif., Coshocton, Ohio, and Waterford, N. Y. Production of laminated plastics has begun at Coshocton. The Waterford plant is one of the largest of the new facilities of the Company. Silicones will be produced there. The Anaheim plant will manufacture Glyptal—General Electric's alkyd resin.

Sales and Income

Your Company's net sales billed to customers amounted to $679,078,216 in 1946, a total 63 per cent greater than in any year prior to 1941 and more than double the average annual volume during the five-year period ended with 1940. After the first quarter of the year, in which sales totaled only $60,427,000 because no shipments could be made for nine weeks while the plants were closed by the strike, the volume increased in each successive quarter to a maximum of $257,600,000—or an annual rate of over a billion dollars—in the final three months.

Only such price increases as were absolutely essential to eliminate losses and to provide reasonable margins were made by your Company during 1946, and, as previously stated, these adjustments did not have any real significant effect on either sales volume or income until the latter part of the year—mainly in the final quarter. On the other hand the effect of wage and salary increases (directly as received by General Electric employees and indirectly as reflected in the resulting higher cost of materials and parts purchased from other companies) was felt throughout the year. This imbalance as to timing of cost increases and compensatory price increases, together with the first quarter operating *loss* of nearly $28,000,000 resulting from the strike, accounted principally for the *loss* from sales for the year of $534,224. An uneven flow of production resulting from shortages of materials and delayed deliveries on incoming materials and parts, as well as the necessity for utilizing substitute materials to maintain shipments on certain critical items—all due primarily to strikes in other industries—also were factors of importance.

Under operating conditions existing in years prior to the war, and in accordance with the generally accepted understanding of business progress under the free enterprise system, your Company ordinarily showed an improvement in the ratio of income from sales to net sales billed as its volume of business increased. A corresponding relative improvement was impossible of accomplishment under conditions existing in 1946. The following statistics on the income or loss from sales in relation to sales billed indicate the effect of strikes and of governmental controls and also the necessity for the price changes made by your Company during the year under review: in the first quarter, as a result of the strike, there was a *loss* from sales equivalent to 45.7 cents on each dollar of sales; in the next six months, despite a sales volume at an annual rate of nearly three quarters of a billion dollars, the *income* from sales was only 3.3 cents on each sales dollar; and in the fourth quarter, when the effect of price increases began to be felt and sales were at an annual rate of over a billion dollars, the income from sales was equivalent to only 5.9 cents per dollar of sales. Thus for the full year the *loss* from sales was equivalent to 0.1 cent per dollar of sales. By way of contrast, in the five years ended with 1940, when the average annual sales volume was only $319,000,000, your Company's income from sales on a comparable basis averaged 15.5 cents on each dollar of sales. It should be borne in mind that the foregoing statistics do not reflect nonoperating income and are *before* provision for Federal taxes on income, contingencies, etc.

From sources other than sales, your Company received income, consisting of interest and dividends from affiliates and other sundry revenue, in the net amount of $10,823,813 during the year 1946. Total income, before consideration of the special credits to 1946 operations referred to below, therefore, amounted to $10,289,589.

Taxes and Special Credits

Provision for Federal taxes on income for the year 1946 amounted to only $250,000, due principally to the loss from sales and to the fact that the major portion of the Company's income from sources other than sales was not subject to taxation.

The total amount provided for all Federal, state and local taxes for the year 1946 was $33,868,000, or 73 per cent less than in 1945.

Since corporations generally were required, during the war years, to pay as Federal taxes more than 80 per cent of all income realized over and above the amount of a so-called "excess profits credit" (in your Company's case the amount was substantially its 1936–1939 average earnings), Congress amended the Internal Revenue Code in 1945 to provide for the remission, for 1946 *only*, of a portion of the wartime taxes paid by those corporations whose earnings for 1946 were less than their "excess profits credit." Accordingly, on the basis of its 1946 operating results, your Company became entitled to a refund of approximately $24,000,000, in contrast with its Federal tax payments of approximately $450,000,000 for the years 1942–1945, inclusive. Since the amount of the Company's claim could not be determined until its otherwise final results for 1946 became known, the entire $24,000,000 was credited to income in the fourth quarter of the year.

Operations were also credited in 1946 with $9,000,000 transferred from the Reserve for postwar adjustments and contingencies. The amount previously set aside in that Reserve is being restored to income regularly over a period of 20 months commencing October 1, 1945 as a partial offset against reconversion and related expenses included in cost of sales.

Net Income and Dividends

After including in income the above described special credits, and after all charges, the net income available for dividends to stockholders was $43,039,589 or $1.49 a share of common stock for 1946, compared with $56,540,555 or $1.96 a share for 1945, a decrease of 24 per cent. The net income for 1946 was equivalent to 6.3 cents on each dollar of sales but without consideration of the special credits to operations it would have been 1.5 cents; for 1945, the net income was equivalent to 4.4 cents on each dollar of sales and it averaged only 4.6 cents per dollar of sales during the five war years ended with 1945. In the five prewar years 1936-1940, inclusive, General Electric's net income was equivalent to 14.6 cents on each dollar of sales.

Cash dividends *declared* during 1946 totaled $1.60 a share of common stock, including the dividend of 40 cents a share which was paid in January, 1947. Cash dividends *paid* during 1946 also totaled $1.60 a share, consisting of payments of 40 cents a share in each of the months of January, April, July and October. These dividend payments, involving approximately $46,000,000, were made to an average of 246,000 stockholders, the number at December 31, 1946 having been 248,541.

Employee Earnings

There were 160,968 employees on the payroll of your Company on December 31, 1946, a 21 per cent increase over the number a year earlier and only 8 per cent less than the record total of 175,290 at the close of 1943. The average number on the payroll during 1946 was 143,766, or 3 per cent less than during 1945.

Total earnings of employees for 1946 aggregated $359,300,000 and average annual earnings per employee amounted to $2,499. However, since approximately 95,000 employees, out of the 120,000 made idle by the strike, received no pay from the Company for 9 weeks, the foregoing figures for employee earnings are not comparable with corresponding figures for prior years. Of more significance is the *annual rate* of average earnings of employees for the last 9 months of 1946, which was $2,830. The latter amount is reasonably comparable with the average annual earnings per employee of $2,695 for 1945 and the previous record of $2,772 for 1944.

On pages 20 and 21 will be found statistics concerning the results of operation and the status of the Company's various employee benefit plans.

Current Assets

Cash and marketable securities held at the close of 1946, after borrowing $200,000,000 under the financing program outlined on page 7, amounted to $157,073,726, or $113,463,586 less than at the close of 1945. Securities in the portfolio were carried at $87,095,313, being the lower of amortized cost or quoted market prices. The securities consisted of about $70,000,000 of U. S. Government obligations which mature within a year and of $17,000,000 of high grade commercial paper maturing within 5 months.

Inventories of your Company, after verification and valuation on the basis stated in a note to the financial statements (page 18), were carried at $251,060,863 at the close of 1946, an increase of $69,629,291 or 38 per cent, during the year. Although this increase was not unreasonable in relation to the expanded sales volume, it was greater than otherwise would have been the case due to an unbalanced condition resulting from shortages and delayed deliveries of raw materials and parts. This unbalanced inventory condition should be rectified gradually as the items in short supply are obtained.

Investments

The major portion of General Electric's investments is accounted for by the holdings of securities of, and advances made to, its affiliates—those companies a majority of whose voting stock it owns. The basis upon which all affiliated companies are valued is stated in the first note to the financial statements on page 18, and comments concerning some of the principal companies are made in the following paragraphs:

The *Domestic Manufacturing Affiliates* include The Mahoning Valley Steel Company, purchased during 1946 to provide a supplementary source of hot-rolled sheet steel, Elmira Foundry Company, Inc., and the following seven companies, the businesses of which are more closely related to those of the operating departments of your Company: Carboloy Company, Inc., General Electric X-Ray Corporation, Hotpoint Inc., Locke Insulator Corporation, The Monowatt Electric Corporation, Telechron Inc., and The Trumbull Electric Manufacturing Company.

The latter group of seven companies had net earnings, available for interest on advances from General Electric and for dividends on common stock, amounting to $1,362,900 for 1946 compared with $3,596,900 for 1945, and paid interest on such advances and dividends on common stock, all of which is owned by your Company, in the aggregate amount of $1,473,450 in 1946 compared with $255,072 in 1945.

Canadian General Electric Company, Ltd., reported net income, expressed in Canadian currency, of $2,411,506 for 1946, compared with $2,181,049 for the preceding year. Earnings available for the common stock were equivalent to $12.16 a share in 1946 and $10.94 a share in 1945. Dividends declared on common stock, 95.4 per cent of which is owned by your Company, amounted to $8.00 a share, the same as in 1945. The dividends received by your Company were booked at $1,370,851, this being the amount realized in U. S. dollars.

Investments

International General Electric Company, Inc., which conducts the export and foreign business of your Company except in Canada, had net income amounting to $1,448,011 for 1946 compared with $2,848,669 for 1945. Cash dividends amounting to $1,500,000 were paid in 1946 compared with $2,800,000 in 1945. Of the 100,000 shares of 7 per cent cumulative preferred stock outstanding, 50,000 shares are held by G.E. Employees Securities Corporation. The remaining shares of preferred stock and all of the common shares outstanding are owned by your Company.

General Electric Supply Corporation, a wholesale distributor operating in more than 100 cities throughout the United States, had net income of $4,370,321 in 1946 compared with $1,096,557 in 1945. On its common stock, the only class outstanding and all of which is owned by your Company, dividends of $1,000,000 were paid in both 1946 and 1945. The Corporation retained a large portion of its 1946 earnings in order to help finance its expanded volume of business. The Corporation's total borrowings on December 31, 1946, all from outside sources, amounted to $20,000,000, represented by short-term commercial paper sold at a discount.

G.E. Employees Securities Corporation, an investment affiliate, was organized to provide a safe medium for the investment of employees' savings in the form of debenture bonds and notes yielding a regular and attractive rate of interest.

The Corporation had net income of $1,423,139 in 1946 compared with $1,382,368 a year earlier. On its common stock, the only class outstanding and all of which is owned by your Company, dividends of $1,432,800 were paid in 1946 compared with $1,429,700 paid in 1945.

As of December 31, 1946, the market or fair value of the Corporation's assets was $122,662,111 (58 per cent being U. S. Government securities and cash and the balance principally preferred and common stocks) or 2.08 times its total liabilities, and its earnings for 1946 were 1.67 times its fixed interest requirements. These ratios a year earlier were 2.15 and 1.63 times, respectively.

Your Company's investment in the Corporation at the close of 1946 cost $32,500,000, represented by common stock and contributed capital surplus, and was carried at $47,780,001.

General Electric Common Stock, which is carried at cost, is held in the portfolio for corporate purposes and there were 19,781.36 shares on hand at the close of 1946. There were 73,850 shares acquired during 1946, including 8,350 shares received as a dividend in kind from Electrical Securities Corporation, and 73,230 shares were disposed of. The latter included 52,896 shares which were exchanged for all outstanding common shares and 96.5 per cent of outstanding preferred shares of The Mahoning Valley Steel Company. The remaining 20,334 shares were distributed to employees of the Company and certain affiliates, as payments under the Extra Compensation Plan for the year 1945, at their market value on the day before such payment was authorized. On December 31, 1946, G.E. Employees Securities Corporation held in its portfolio an additional 522,200 shares, also carried at cost, this being the largest single holding of your Company's stock.

Investments

The *Miscellaneous Securities* of your Company consist of its direct financial interest in companies a majority of whose voting stock it does not own, together with sundry other securities. These investments were carried at market value or estimated fair worth where no market value existed, the aggregate of such values being lower than aggregate cost.

Foreign investments in companies located in Germany, Italy and Japan were carried at no value. The foreign currency values of investments in companies located in other countries were converted into U. S. dollars at exchange rates in effect as of the last day of the year, less a safety factor.

The 1946 revaluation of all investments resulted in the following adjustments: a reduction of $2,305,732, representing the difference between the required additional provision for intercompany profits in the year-end inventories of the affiliated companies and General Electric's equity in the net undistributed earnings of these companies for the year, which was charged to Earned Surplus; a reduction of $197,562, representing the net unrealized depreciation in value of securities of an investment character, which was charged to the Reserve for Investments; and an increase of $4,165,695, representing realized net profit on securities disposed of, of which $4,182,241 was added to the General Reserve and $16,546 was charged to Capital Surplus.

Plant and Equipment

An analysis of changes in plant and equipment accounts during 1946 is shown below:

Cost, December 31, 1945		$303,571,667
Added during 1946		86,930,337
		390,502,004
Disposed of during 1946		17,591,962
Cost, December 31, 1946		372,910,042
Depreciation reserves, December 31, 1945	$268,298,883	
Added by charges to income during 1946	19,717,731	
Proceeds from sales, etc., during 1946	1,474,019	
	289,490,633	
Cost of items disposed of during 1946	17,591,962	271,898,671
Net book value, December 31, 1946		$101,011,371

Your Company's plant modernization and expansion program is outlined on pages 7 and 8, and on page 31 will be found a listing of the 72 cities and 16 states in which its 93 plants were situated as of November 1, 1946.

The Yearbook section beginning on page 23 contains information concerning certain phases of your Company's research and engineering developments, as well as descriptions of some of its products and the scope of its activities.

Respectfully submitted for the Board of Directors.

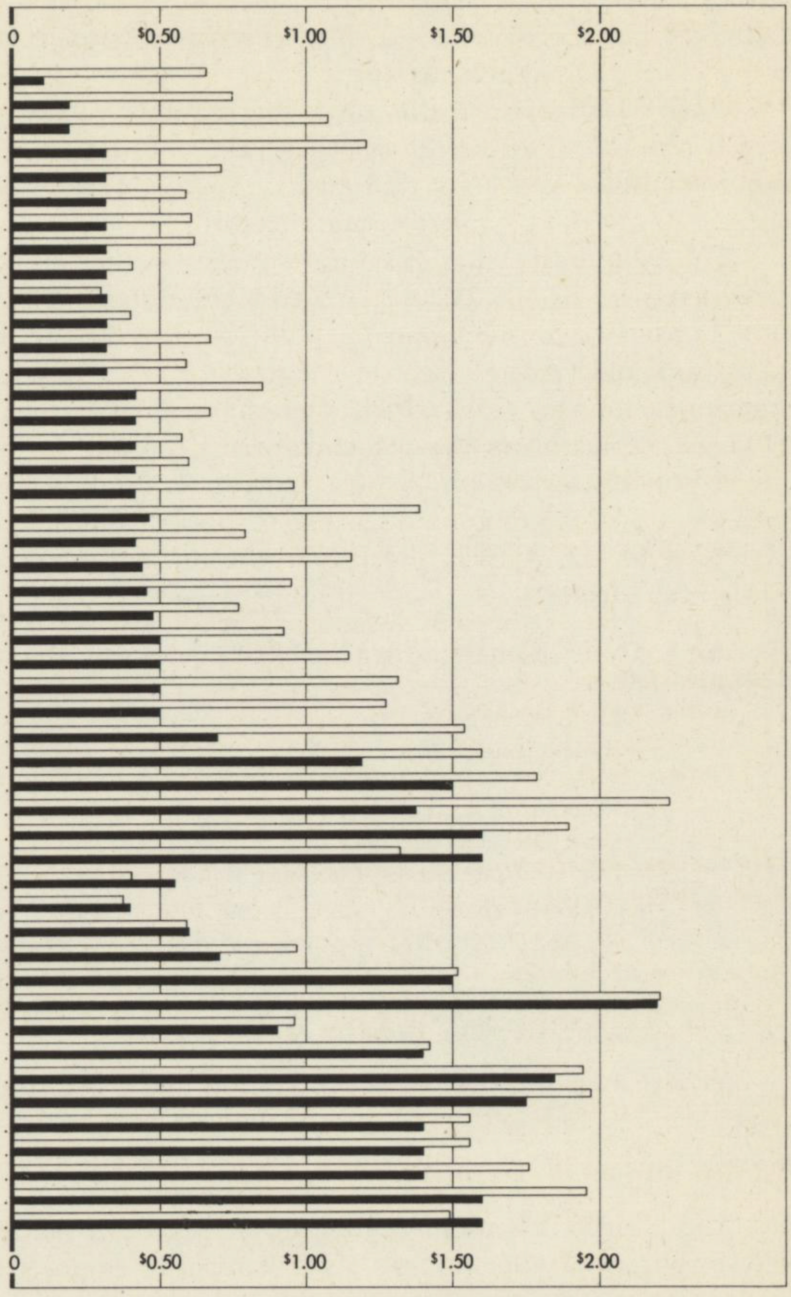
C. E. Wilson

PRESIDENT

48-YEAR RECORD OF EARNINGS AND DIVIDENDS PER SHARE OF COMMON STOCK

Year	Earnings (a)	Dividends (b)
1899	$27.46	$4.50
1900	30.99	8.00
1901	44.80	8.00
1902	30.02	8.00
1903	17.76	8.00
1904	14.59	8.00
1905	15.17	8.00
1906	15.52	8.00
1907	10.17	8.00
1908	7.37	8.00
1909 (e)	9.96	8.00
1910	16.66	8.00
1911	14.55	8.00
1912	16.20	8.00
1913	12.88	8.00
1914	11.03	8.00
1915	11.56	8.00
1916	18.31	8.00
1917	26.50	9.00
1918	14.93	8.00
1919	20.93	8.00
1920	16.62	8.00
1921	12.92	8.00
1922	14.86	8.00
1923	18.40	8.00
1924	21.13	8.00
1925	20.49	8.00
1926 (c)	6.14	2.75
1927	6.41	4.75
1928	7.15	6.00
1929	8.97	5.50
1930 (c)	1.90	1.60
1931	1.33	1.60
1932	.41	.55
1933	.38	.40
1934	.59	.60
1935	.97	.70
1936	1.52	1.50
1937	2.21	2.20
1938	.96	.90
1939	1.43	1.40
1940	1.95	1.85
1941	1.98	1.75
1942	1.56	1.40
1943	1.56	1.40
1944	1.76	1.40
1945	1.96	1.60
1946	1.49	1.60

Earnings ☐ and Dividends ▬ in Terms of Present Stock (c) (d)



(a) Based upon average number of shares outstanding. (b) Cash dividends declared. (c) Number of shares increased four for one in May, 1926 and again in January, 1930. (d) Adjusted for common stock dividends. (e) Eleven months.

The following dividends have been distributed in stock: 1902—66⅔% in common stock, to restore a 40% reduction made in 1898; 1912—30% in common stock; 1917—2% in common stock; 1918-1921 inclusive—4% annually in common stock; 1922-1925 inclusive—5% annually in special* stock; 1924—one share of Electric Bond and Share Securities Corporation stock; 1926—one dollar in special* stock; 1932—⅙ share of Radio Corporation of America common stock.

*Special stock, par value $10 a share, paying 6% annual dividend. Retired in 1935 at $11 a share and accrued dividend.

GENERAL ELECTRIC COMPANY

STATEMENT OF ORDERS RECEIVED, INCOME AND EARNED SURPLUS

	YEAR ENDED DECEMBER 31	
	1946	1945
Orders received	$941,881,443	$ 844,540,227
Net sales billed (Note 2)	$679,078,216	$1,298,221,886
Costs, expenses, and other charges, except those shown separately below	659,894,709	1,125,689,107
Depreciation and amortization of plant and equipment (Note 3)	19,717,731	40,581,028
	679,612,440	1,166,270,135
Income or *loss* from sales	*534,224*	131,951,751
Income from other sources:		
Interest and dividends from affiliated companies	10,071,650	7,941,812
Other sundry revenue	1,971,230	1,964,109
	12,042,880	9,905,921
Less interest and other financial charges	*1,219,067*	*567,117*
	10,823,813	9,338,804
Total income, before charges or credits shown below	10,289,589	141,290,555
Charge or *credit* for:		
Federal taxes on income for year	250,000	96,000,000
Claim for refund of prior years' Federal taxes (Note 4)	*24,000,000*	*9,000,000*
Postwar adjustments and contingencies (Note 5)	*9,000,000*	*2,250,000*
	32,750,000	84,750,000
Net income for the year	43,039,589	56,540,555
Earned surplus at beginning of year	174,392,576	162,834,800
	217,432,165	219,375,355
Revaluation of investments in affiliates for differences between net income or losses and dividends paid (Note 1)	*2,305,732*	1,109,128
	215,126,433	220,484,483
Dividends on common stock	46,127,896	46,091,907
Earned surplus at end of year	$168,998,537	$ 174,392,576

The notes appearing on page 18 constitute an integral part of this statement.

GENERAL ELECTRIC COMPANY BALAN

Assets

	1946		1945	
Current assets:				
Cash and marketable securities:				
Cash	$ 69,978,413		$ 58,289,518	
Marketable securities (quoted market $87,095,578)	87,095,313		190,681,230	
Postwar tax refund bonds	—	$157,073,726	21,566,564	$270,537,312
Accounts and notes receivable, less reserves:				
Customers	82,914,436		60,049,339	
Affiliated companies	33,296,427		16,123,150	
Contract termination claims accrued	2,556,725		127,545,410	
Claim for refund of prior years' Federal taxes (Note 4)	24,000,000		9,000,000	
Other	8,452,353	151,219,941	5,011,871	217,729,770
Inventories, less reserves (Note 6)		251,060,863		181,431,572
		559,354,530		669,698,654
Less: Progress collections on contracts	*23,292,736*		*30,836,329*	
Price adjustments accrued	*1,630,276*	*24,923,012*	*16,202,691*	*47,039,020*
Total current assets		534,431,518		622,659,634
Investments:				
Affiliated companies (Note 1):				
Domestic manufacturing companies	35,631,447		18,087,361	
Canadian General Electric Company, Ltd.	18,249,690		16,816,743	
International General Electric Company, Inc.	47,647,532		42,835,549	
General Electric Supply Corporation	8,968,323		10,603,002	
General Electric Credit Corporation	12,818,552		4,382,183	
Electrical Securities Corporation (Note 7)	74,653,978		77,525,477	
G.E. Employees Securities Corporation	47,780,001		48,286,664	
Others	7,629,312		5,877,609	
	253,378,835		224,414,588	
General Electric Company common stock	851,459		658,704	
Miscellaneous securities	2,073,703		2,053,197	
	256,303,997		227,126,489	
Less: Reserve for investments	*85,503,599*		*85,701,161*	
Total investments		170,800,398		141,425,328
Fixed assets:				
Plant and equipment—cost	372,910,042		303,571,667	
Less: Depreciation reserves	*271,898,671*		*268,298,883*	
Plant and equipment—net	101,011,371		35,272,784	
Patents and franchises	1		1	
Total fixed assets		101,011,372		35,272,785
Assets of special funds:				
Funds for payments under U.S. Government contracts	13,989,044		50,000,000	
Employee withholding tax and benefit plan collections	13,075,585		13,083,481	
Total assets of special funds—per contra		27,064,629		63,083,481
Other assets (Note 8)		4,582,686		4,710,114
Total assets		$837.890.603		$867,151,342

CE SHEET DECEMBER 31, 1946 AND 1945

Liabilities and Capital

	1946		1945	
Current liabilities:				
Accounts payable	$ 39,574,699		$ 28,173,198	
Due to affiliated companies	29,822,292		33,200,152	
Accrued Federal taxes on income for year	250,000		96,000,000	
Other accrued items	103,363,215		191,373,153	
Dividends unpaid	11,531,511		11,537,599	
Total current liabilities		$184,541,717		$360,284,102
Notes payable (Note 9)		200,000,000		—
Accounts payable and accruals—not current		7,645,708		7,769,227
Special funds:				
Funds for payments under U.S. Government contracts	13,989,044		50,000,000	
Employee withholding tax and benefit plan collections	13,075,585		13,083,481	
Total special funds—per contra		27,064,629		63,083,481
Miscellaneous reserves		40,506,924		47,654,563
Reserve for postwar adjustments and contingencies (Note 5)		3,750,000		12,750,000
General reserve (Note 1)		11,803,353		7,621,112
Special stock—6% cumulative; par value $10 (authorized and unissued 1,207,036 shares)				
Common stock and surplus:				
Common stock (authorized 29,600,000 shares no par value; issued 28,845,927.36 shares)	180,287,046		180,287,046	
Capital surplus	13,292,689		13,309,235	
Earned surplus	168,998,537		174,392,576	
Total common stock and surplus		362,578,272		367,988,857
Total liabilities and capital		$837,890,603		$867,151,342

The notes appearing on page 18 constitute an integral part of this statement.

NOTES TO FINANCIAL STATEMENTS

*1. **General:*** The Financial Statements reflect only the accounts of the parent General Electric Company so that net income for the year as shown in the Statement of Orders Received, Income and Earned Surplus does not include undistributed earnings of affiliated companies, and the assets and liabilities shown in the Balance Sheet do not reflect the detailed asset and liability accounts of the affiliated companies. However, dividends received from affiliated companies are included in the parent company's net income and the value of the parent company's investment in each affiliate is adjusted each year end so as to represent General Electric's advances to, and equity in the net worth of, the affiliate computed on the same basis of accounting as that employed by the parent company. In the year-end revaluation adjustment, changes in net worth of the affiliates which are attributable to differences between earnings from operations and dividends paid are credited or charged to the parent company's Earned Surplus account as "Revaluation of investments in affiliates for differences between net income or losses and dividends paid"; changes in net worth resulting from the realization of profits or losses on securities sold or otherwise disposed of by affiliates are credited or charged to the parent company's General Reserve, or, if the security involved is General Electric stock, to Capital Surplus; and changes in net worth attributable to unrealized appreciation or depreciation of securities owned by the affiliated companies are credited or charged to Reserve for Investments. For this purpose, the determination of undistributed earnings from operations includes provision for elimination of intercompany profits included in the inventories of the respective companies and for the estimated amount of income taxes which will be payable in the event of subsequent distribution of retained earnings.

*2. **Net sales billed:*** Sales for 1945 include actual and estimated billings applicable to contract termination claims aggregating approximately $215,000,000. The counterpart for 1946 is not significant.

*3. **Depreciation and amortization of plant and equipment:*** The 1945 amount includes amortization of $23,650,000 applicable to wartime emergency facilities. These facilities were fully amortized during the period from 1940 to 1945 and, as a result, no depreciation applicable to them is included in the operating accounts for 1946.

*4. **Claim for refund of prior years' Federal taxes:*** The 1946 amount represents the approximate refund of 1944 taxes to which the Company is entitled under the provisions of the Internal Revenue Code relating to the carry-back of excess profits credit. The 1945 amount represents the refund of taxes for the years 1940–1944 attributable to the additional amortization of emergency facilities to which the Company became entitled as a result of the termination of the amortization period on September 29, 1945.

*5. **Postwar adjustments and contingencies:*** All expenditures relating to discontinuance of war production and reconversion to peacetime activities have been included in current costs. However, as a partial offset to these expenditures, the amount of $15,000,000 which was appropriated from income during the years 1942–1944, inclusive, as a Reserve for postwar adjustments and contingencies, is being restored to income ratably over the period of 20 months commencing October 1, 1945.

*6. **Inventories:*** Inventories, which were verified by physical count during the latter part of the year, are valued, in accordance with long established practice, at the lower of cost (which does not include certain indirect manufacturing expenses) or market, less reserves. Inventory reserves make provision for possible losses on inactive and unbalanced stocks, for possible price declines, and for profits booked by affiliated companies on intercompany products included in the parent company's year-end inventory.

*7. **Investment in Electrical Securities Corporation:*** This Corporation was dissolved in February 1947 and General Electric Company, the sole stockholder, received all its assets, subject to its liabilities, as a liquidating distribution in complete redemption and cancellation of its outstanding stock. As of the date of distribution the net market or fair value of these assets, which included cash and government securities of about $44,000,000, was approximately equal to the December 31, 1946 value of the Company's investment in Electrical Securities Corporation as shown on the Balance Sheet.

*8. **Other assets:*** These consist of marketable securities deposited as guarantees (1946 amount $1,976,160), accounts and notes receivable—not current (1946 amount after deduction of applicable reserves $1,837,479) and miscellaneous assets (1946 amount after deduction of applicable reserves $769,047).

*9. **Notes payable:*** These represent borrowings of $150,000,000 from eleven insurance companies and one bank as Trustee of various trusts, evidenced by twenty-year promissory notes dated December 2, 1946, and bearing an interest rate of 2.55%, and $50,000,000 from various banks evidenced by five-year notes dated December 3, 1946, and bearing an interest rate of 1⅝%. Under the terms of the loan agreements applicable to the twenty-year notes the Company must repay $3,000,000 per annum commencing in 1953 and has the right to repay $3,750,000 on June 1, 1947 and $7,500,000 annually thereafter without payment of premium. Larger amounts may be repaid at any time upon payment of a premium which decreases as the notes approach maturity. The bank loans may be repaid at any time without payment of premium. In addition to these borrowings by General Electric Company, General Electric Supply Corporation has borrowed on its own account $20,000,000 through the sale of commercial paper having maturities of not exceeding nine months—$16,000,000 at a discount of 1⅛% and $4,000,000 at a discount of 1¼%.

*10. **Contingent liabilities:*** No provision has been made in the accounts of the Company for any liability which may exist by reason of the so called "portal to portal" retroactive pay suits which have been instituted against the Company as well as many other large industrial employers. The amount, if any, of this contingent liability is impossible to estimate.

REPORT OF INDEPENDENT PUBLIC ACCOUNTANTS

PEAT, MARWICK, MITCHELL & CO.
Seventy Pine Street
New York 5, N. Y.

To the Board of Directors of
General Electric Company, New York, N. Y.

We have examined the balance sheet of the General Electric Company as of December 31, 1946 and the statement of income and earned surplus for the year then ended, have reviewed the system of internal control and the accounting procedures of the Company and, without making a detailed audit of the transactions, have examined or tested accounting records of the Company and other supporting evidence, by methods and to the extent we deemed appropriate. Our examination was made in accordance with generally accepted auditing standards applicable in the circumstances and included all procedures which we considered necessary.

We examined the accounts of Canadian General Electric Company, Limited, International General Electric Company, Incorporated, General Electric Supply Corporation, General Electric Credit Corporation, Electrical Securities Corporation, G.E. Employees Securities Corporation and General Electric Realty Corporation, on all of which we have reported separately. No examination has been made by us of other companies controlled through stock ownership, but balance sheets of these companies have been submitted to us and their accounts, with certain minor exceptions, are examined periodically by the internal audit staff of your Company under the direction of your Comptroller. We reviewed their reports and generally satisfied ourselves that your established accounting procedures are being followed. The investments in affiliated companies are carried at amounts based on the accounts thus examined. General Electric Company common stock is stated at cost. These, and the miscellaneous investments, are, in our opinion, conservatively stated.

In our opinion, the accompanying balance sheet and related statement of income and earned surplus present fairly the position of General Electric Company at December 31, 1946 and the results of its operations for the year, in conformity with generally accepted accounting principles applied on a basis consistent with the preceding year.

Peat, Marwick, Mitchell & Co.

New York, N. Y.,
February 28, 1947

EMPLOYEE BENEFIT PLAN STATISTICS

General Profit Sharing Plan (Authorized by stockholders in 1934)	
Earnings under Plan for 1946	$ 2,119,157
Undistributed earnings under Plan for previous year	171,507
Available for distribution to eligible employees	$ 2,290,664
Extra Compensation Plan (Authorized by stockholders in 1934)	
Amount accrued under Plan for 1946	$ 1,997,770
of which such portion as the Directors may determine will be distributed to eligible employees in 1947. The amount accrued for 1945 was $3,229,304 of which $2,833,685 was distributed.	
Suggestion Plan (Formalized in 1922; awards made since 1906)	
Awards for employees' suggestions—year 1946	$ 100,000
—24 years ended December 31, 1946	$ 1,964,000
Life Insurance Plan* (Established in 1920)	
Insurance paid for by the Company	$127,209,407
Additional insurance paid for by employees	309,540,230
Total life insurance in force December 31, 1946	$436,749,637
Number of employees insured	126,383
Benefits paid—year 1946	$ 2,078,230
—27 years ended December 31, 1946	$ 28,653,621
Number of beneficiaries	12,394
Savings Plans	
Employees' Savings Plan* (Established in 1923)	
G.E. Employees Securities Corporation:	
Debenture bonds issued—24 years ended December 31, 1946 (a)	$107,433,510
Debenture bonds redeemed in this period	75,686,660
Debenture bonds held by individuals December 31, 1946 (b)	31,746,850
Notes held by Additional Pension Trust December 31, 1946 (c)	24,120,000
Total obligations December 31, 1946, representing employees' savings	$ 55,866,850
Total interest and additional payments made on the Corporation's obligations—24 years ended December 31, 1946	$ 55,131,225
(a) No offering since 1941.	
(b) Number of bondholders	22,090
(c) Number of Additional Pension Plan participants (see opposite)	31,580
U.S. Savings Bond Plan (Established in 1941 as War Savings Plan)	
Bonds paid for by employees May 1, 1941 to December 31, 1946 (cost)	$194,350,827
As of December 31, 1946, employees had authorized payroll deductions for the purchase, at an annual rate, of Bonds costing	$ 13,442,392
Vacation Plan (Established in 1892)	
Vacation and military duty allowances for year 1946	$ 11,000,000

Statistics apply to General Electric and its affiliated companies.

Pension Plans*

Company Pension Plan (Established in 1912; amended in 1946 as authorized by stockholders. Provides old age pensions, disability pensions, and payments upon death under certain conditions. Employees have a vested right to pensions upon compliance with certain conditions as to age and service. Pensions are divided into two parts (1) past service annuities—paid for entirely by the Company—for all employees who had one or more years of continuous service on September 1, 1946, and (2) future service annuities—paid for jointly by the Company and employees—applicable to service after September 1, 1946 for all employees who elect to participate)

Assets of the General Electric Pension Trust February 28, 1947 (a)	$114,700,000
Pension and life retirement payments—year 1946	$ 4,020,223
—35 years ended December 31, 1946	$ 46,508,658
Number on pension and life retirement rolls December 31, 1946	6,029
Average age	69.6 years
Average continuous service	29.7 years

(a) The assets consist principally of U.S. Government securities. Company payments of $12,474,000, and employee payments of $2,912,000 (beginning as of September 1), were made to the Trust for the year 1946.

Additional Pension Plan (Established in 1928 to promote saving by employees for supplemental pension purposes; revised as of September 1, 1946 to provide for retention of amounts accumulated on that date but to discontinue further payments to the Trust)

Assets of the Additional Pension Trust December 31, 1946 (b)	$ 25,058,000
Number of participants	31,580
Amount returned to participants—19 years ended December 31, 1946	$ 12,399,000

(b) The assets consist principally of notes of G.E. Employees Securities Corporation (see Employees Savings Plan—opposite page).

NOTE: A contributory Pension Plan in operation since 1935 was terminated as of July 31, 1946, in view of pending amendments of the Company Pension Plan, and the Contributory Pension Trust was liquidated in September, 1946, upon distribution of its assets in accordance with provisions of the Trust Indenture.

Relief and Loan Plans (Established in 1936; funds contributed equally by the Company and employees)

Assets of Relief and Loan Associations December 31, 1946	$ 2,960,860
Eleven years ended December 31, 1946—loans granted	$ 4,941,055
—loans repaid	$ 4,772,135
—relief payments	$ 194,893

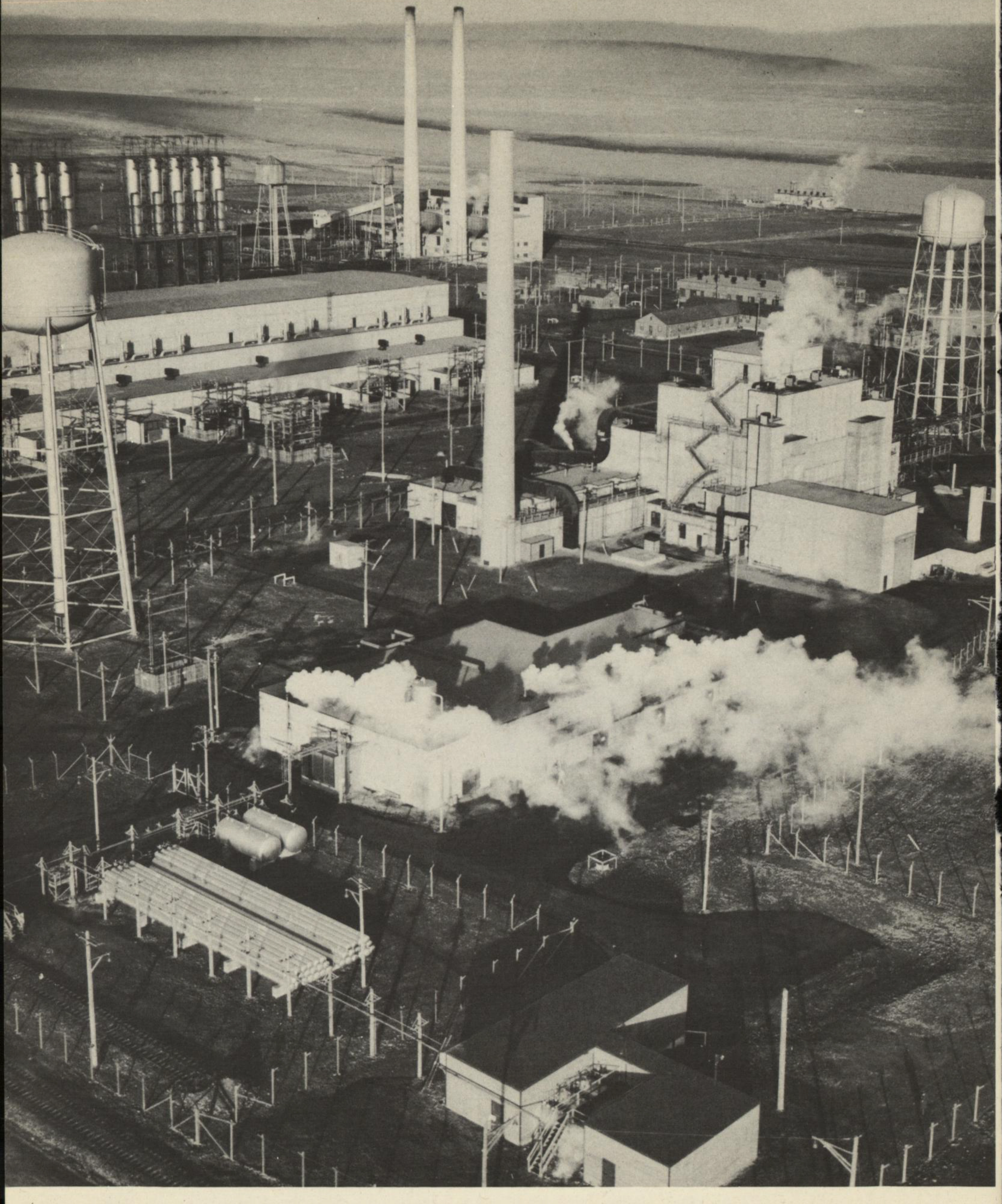
General Electric Educational Fund* (Established in 1945, in honor of Charles A. Coffin and Gerard Swope, the Fund consists of the Charles A. Coffin Foundation, created in 1922, the Gerard Swope Foundation and the G.E. Employees Education Foundation. Income of the Fund provides educational loans, fellowships and scholarships for employees and others)

Assets of the General Electric Educational Fund December 31, 1946	$ 1,029,480
Amount granted—24 years ended December 31, 1946	$ 171,995
Number of grants	309

Other Employee Benefits include educational courses and, in special circumstances, loans for purchase of homes.

Through Mutual Benefit Associations (established in 1902) and through a Group Disability Insurance Plan (established in 1939) employees and their families may receive disability, hospitalization, surgical and death benefits for sickness and accident cases not covered by Workmen's Compensation Laws; in general, the cost of benefits paid under these Plans is borne by employees, and the cost of their administration is borne by the Company.

**Statistics apply to General Electric and its affiliated companies.*



One of the plants of the Hanford atomic energy works in Washington State operated for the government.

Yearbook
FOR 1946

GENERAL ELECTRIC, to a greater degree than ever before, became identified in 1946 with the atomic energy program being carried on by the government. A vast research program for the study of power generation by atomic energy, as well as the operation of the government's Hanford Engineer Works, a $350,000,000 project in the State of Washington, was undertaken by your Company during the year under a cost-plus-$1-fee contract.

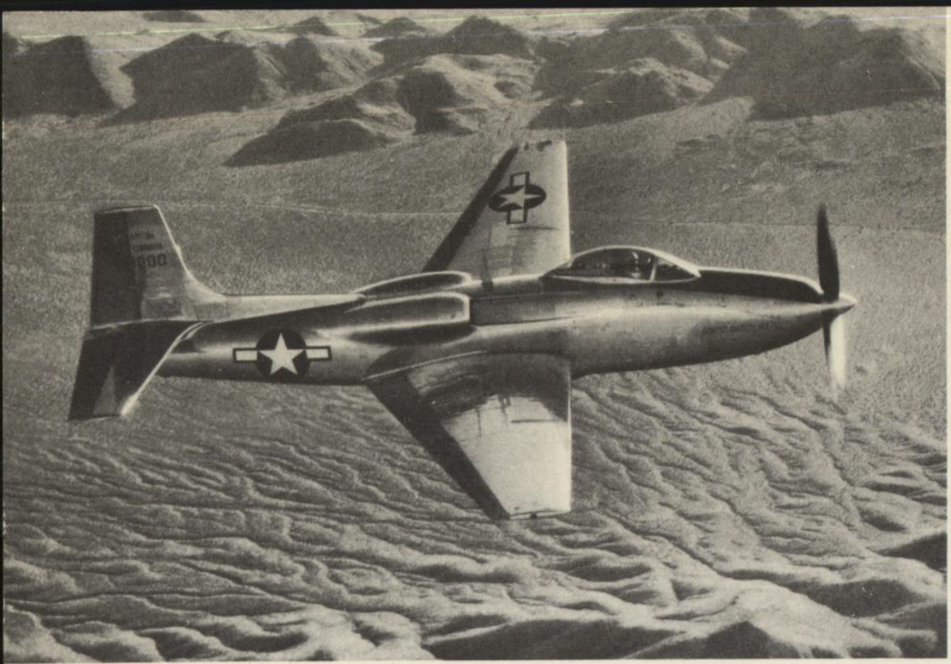
Atomic Power for Industry

The atomic energy research program will be centered at a $20,000,000 government laboratory to be built near Schenectady, and it will be operated by the General Electric Research Laboratory. To be known as the Knolls Atomic Power Laboratory, the site adjoins the new Research Laboratory of the Company now under construction, announcement of which was made in the 1945 Annual Report. The new Research Laboratory will be usable partially in the autumn of 1947. Work on the government laboratory will be begun in 1947 and it is expected that it will be completed in 1948.

The entire scientific, engineering, and manufacturing facilities of the Company will be drawn upon to further the atomic power project. In addition to the fundamental studies being made in the Research Laboratory, which will be greatly augmented when the government laboratory is completed, the General Engineering and Consulting Laboratory has begun an extensive program of experimental work on atomic power plants. Concurrently with the work undertaken for the government, the Company is carrying on independent studies relating to the utilization of atomic energy for industry.

Research in all phases of atomic power development and in specific problems of operation of the Hanford Engineer Works is included in the program undertaken for the government. For these studies the Knolls Atomic Power Laboratory will include chemical, physical, metallurgical, chemical engineering laboratories, and such special facilities as a uranium reactor, or "pile," and atom smashers.

Operation of the Hanford Engineer Works, which was built during the war and is situated in a 600-square-mile isolated area in Washington State, was taken over by the Company last September 1. It was at Hanford that fissionable material was manufactured for the atomic bombs. A branch of the Research Laboratory was established at Hanford soon after the Company took over operations there.



PROP-JET combines conventional propeller and jet propulsion. Research projects include rockets.

Scientists and engineers are in general agreement that atomic energy will not suddenly replace present sources of industrial power. Atomic power, at least in its early stage of development, will not be able to compete with coal and oil and water as the prime sources of electric energy. Even in later developmental stages, in areas where coal, oil, and water are readily accessible, atomic energy may not be economical. As revolutionary as it is, atomic energy is still merely a source of power which must be harnessed, and harnessed perhaps in the same way that the power in coal, oil, and water is harnessed.

To aid in the atomic energy investigations, the Company has retained as consultants some of the leading scientists who were engaged in work on the atomic bombs. When the combined facilities of the new Research Laboratory and the new government laboratory are in full operation, the Company will have added about 200 scientists and some 600 technicians to its staff.

Why Research?

While the atomic energy program overshadows all other current research in its potentialities and in its grip on the public's imagination, the Company's constant aim of developing new things for useful application continues through its usual research facilities. Back of almost every improvement of products, back of almost every gain in efficiency of General Electric machines, is a long story of fundamental research, applied research, engineering, and development.

The great advances in the efficiency of the steam turbine, for instance, have been largely dependent on the development of new alloys capable of withstanding higher stress at higher temperatures. In the same way new chemical materials are being sought, new materials that will do a particular job better or at less cost. The silicone project continues to occupy an important place in the chemical research program, supporting the pilot plant and production phases of this development. In another field, that of electronics, war developments in radar and radar counter measures opened up the microwave field. New important industrial applications are being studied and developed: the heating of insulating materials and plastics by electronics, the thawing of frozen foods, the heating of precooked dinners. In spite of the fact that the efficiency of the electric light bulb has been increased more than five times since General Electric lamp research began, General Electric scientists are working constantly toward the development of even better lamps.

Rockets and Ram-jets

For the Army Ordnance Department, the Company has undertaken research on guided missiles. The program was started in November, 1944, and General Electric scientists were sent to Europe to study captured German V-2 rockets before V-E Day, but last year the program was considerably enlarged, and the Army established special facilities near Schenectady for testing new types of rocket and jet motors.

The primary objective of the program is to develop rockets which will surpass the German V-1 and V-2 in speed, distance, accuracy, and effectiveness. The research is following two lines: ram-jets and rockets. The ram-jet is, in principle, a cylinder which takes in air that is compressed by speed of flight, adds and burns a fuel, and derives forward motion from the thrust produced by expanding the resulting hot gases through a nozzle. As it depends upon oxygen from the air, it is limited in altitude to approximately the ceiling of aircraft. In rockets the gases are formed by the combustion of the fuel with liquid oxygen, both carried in the rocket itself. Since the rocket carries its own oxygen, its altitude is not limited by the lack of oxygen outside the earth's atmosphere.

Rocket-propelled missiles already have reached over 100 miles above the earth, and these experiments are adding immeasurably to man's knowledge of outer space. Instead of a "war head" the rockets carry special instruments which measure temperature, pressure, solar and cosmic ray intensities, and other quantities.

Plane Propulsion

General Electric's contributions to the aviation industry, in peace as well as in war, were dramatized during the year by the formal opening of the Flight Test Center near Schenectady. This facility consists of a large hangar with suitable shop equipment, the necessary runways and planes which are in reality flying laboratories.

Development work was continued on the G-E Turbo-Jet, a gas turbine for jet propulsion. A Republic Thunderjet equipped with a TG-180 Turbo-Jet, designed and built by the Company, reached a speed of 619 miles per hour in a test in the latter part of the year. There is every reason to believe that further improvements in power and fuel consumption, now under study, will mean a further increase in speed. Quantity production of Turbo-Jets by the end of 1947 is anticipated.

The jet principle has been combined with that of the conventional propeller in the Prop-Jet engine, the first propeller-drive gas turbine ever constructed. Eighty per cent of its power drives a conventional propeller, and the remaining 20 per cent is in the form of jet propulsion. It is expected that two commercial airplane types will be fitted with the Prop-Jet to determine the feasibility of this power plant for commercial use.

The gas turbine is also being used in another combination. It was a logical step to harness the exhaust of the conventional reciprocating airplane engine by running it through a turbine and allowing the additional power thereby created to be fed back to the engine crankshaft. This is done in a "compound engine," and development work is in progress in collaboration with manufacturers of reciprocating aircraft engines.

New forms of turbosuperchargers embodying the results of experience gained in the war have been developed for installation in such high-speed high-altitude commercial transports as the Boeing Stratocruiser and the Republic Rainbow, and on the Northrop B-35 Flying Wing and the Consolidated Vultee B-36 bomber. This auxiliary will be used also on the Boeing B-50 and on Lockheed's Constitution.

Generation of Electricity

The development, design, and construction of machines to generate and distribute electricity are, of course, basic activities of the Company. Generators built by General Electric produce about 60 per cent of all the electricity used in American industry and homes.

Advances continue to be made in steam turbine-generator units. The trend is toward using steam at higher temperatures and at greater pressures, increasing the efficiency of generating electricity—more of it at less cost—and what is of tremendous importance to the national economy, at less expenditure of coal and oil. It is estimated that over six hundred million dollars is saved annually in these fuels as a result of the increase in efficiency of power generation since 1920.

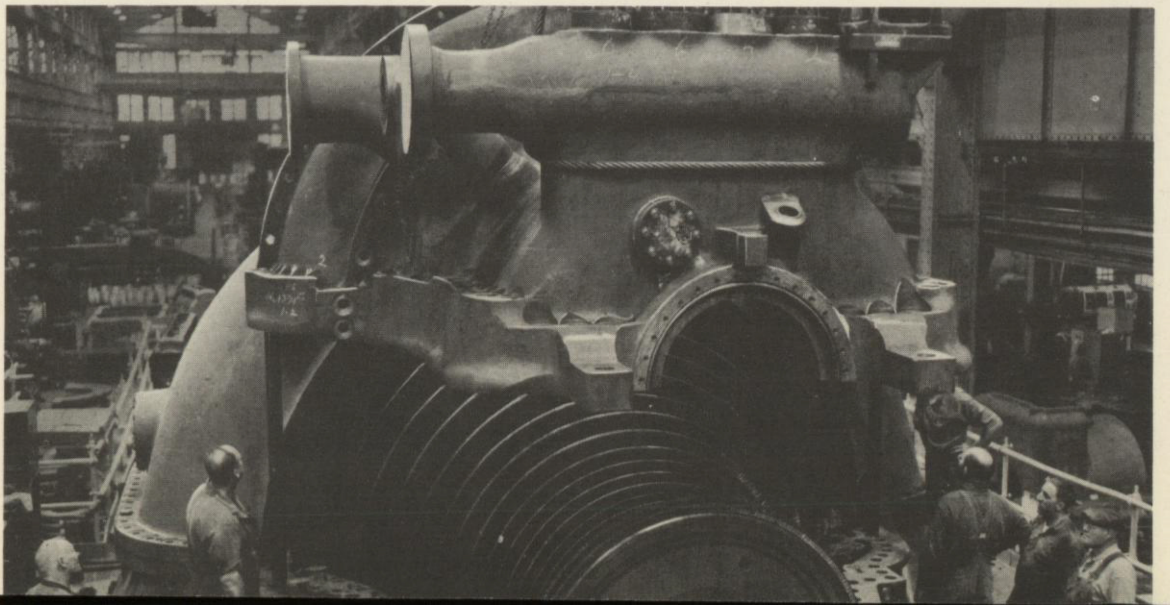
Progress was likewise made in the design and construction of waterwheel-driven generators. The Company delivered last year three 90,000-kva generators to replace machines destroyed by the Germans at the famous Dnieprostroy Dam in the Soviet Union. These generators have a rating 16 per cent higher than the original ones, completed by General Electric in 1931.

Motors at Work

Electric motors are the muscles of industry and of many home appliances. Shipments of General Electric motors late in 1946 were at the rate of over 7,000,000 annually. The manufacture of motors, of cable, switchgear, transformers, etc., provides a large portion of the Company's business. The Company makes motors ranging from 1/100 horsepower to the largest motor drive in the world—89,000 horsepower —developed for a wind tunnel.

It is estimated that an average of 11 electric motors are in use in each moderate-income home in America. They run refrigerators, mixers, oil burners, washing machines, clocks, and many other devices. They are used even more widely in industry. It is not possible to enumerate all the new or unusual applications of motors, but a

Steam turbine, for Detroit Edison, is assembled in the world's largest electrical workshop.



few examples will indicate the scope of what is being accomplished in this field.

In mining, for instance, a General Electric equipped hoist was installed last year which lifts ten tons of ore up a 2500-foot slope at the rate of 29 trips an hour. The hoist rooms were hewn from solid rock in the heart of a mountain in the Coeur d'Alene district of northern Idaho.

Seven coal mine hoists, of the same general design, were developed. The hoists are capable of lifting about 12 tons of coal 50 times an hour from a vertical depth of 1900 feet.

On oil-drilling rigs used to drill for oil under the floor of the ocean, the Company applied governor equipment which had been developed for diesel-electric locomotives. The drilling rigs were mounted on barges, and they are capable of drilling to a depth of from 15,000 to 20,000 feet.

Twenty-five per cent more wood fiber is being obtained in a new pulp and paper mill at Everett, Washington, by use of a hydraulic log "barker" instead of the disk-barking or drum-barking machines previously used. An entire log is barked in 30 seconds or less by high-pressure water jets coming from pumps operated by General Electric motors. The logs pass through a nozzle assembly on concave, spiked rolls, and are stripped of all bark, dirt, and decayed wood in one pass. The logs are then moved onto the whole-log chipper. The new method is said to produce cleaner, more usable wood fiber than did the former.

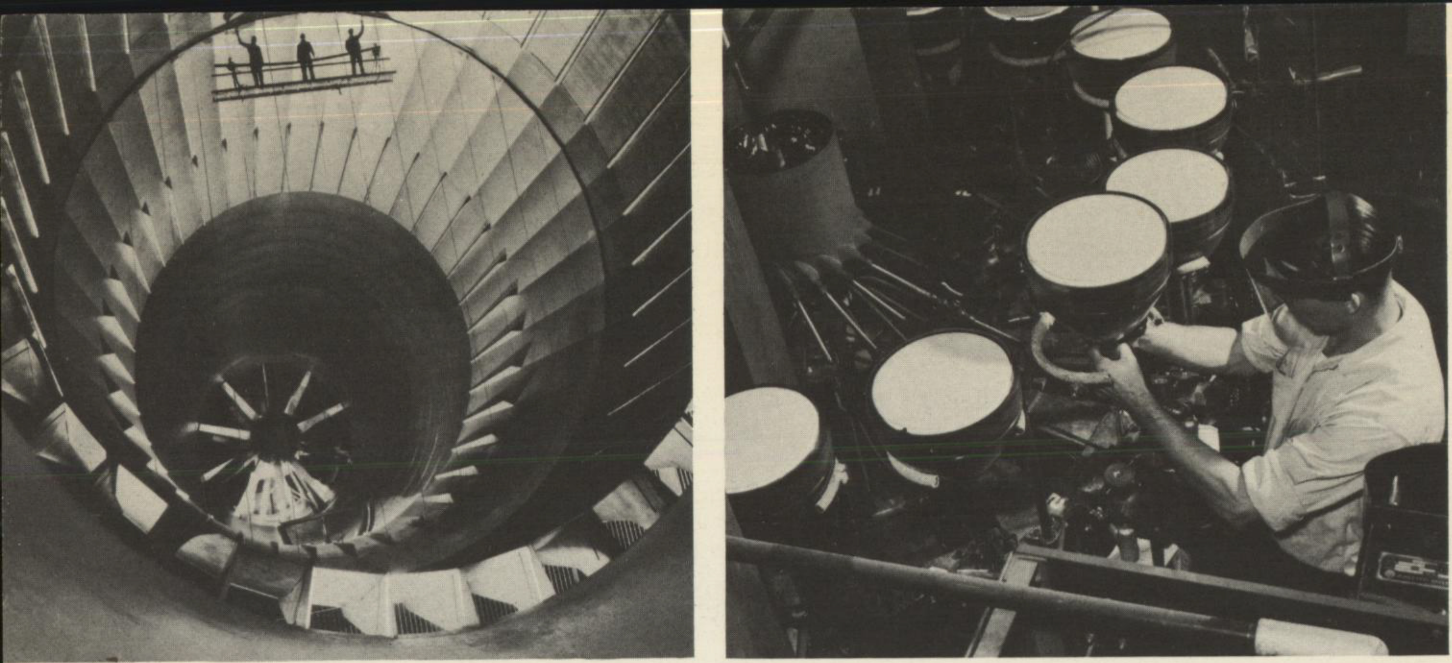
Land Transportation

The railroads of the United States installed more than a million horsepower in electric and diesel-electric locomotives in 1946, and a very substantial portion of this horsepower was in General Electric propulsion equipment.

Jointly with the American Locomotive Company, General Electric announced four new diesel-electric locomotives for railroad service. This gives Alco-G.E. a complete line of locomotives, designed to meet any operating requirements.

Demand for electric locomotives comes from both the domestic and foreign markets. The Company has under construction, for example, giant motor-generator locomotives for the Great Northern Railway and the Virginian Railway, and 50 complete electric locomotives for railroads in Brazil. General Electric will equip over 60 per cent of the 1762 trolley coaches ordered in 1946.

Alco-G. E. diesel-electric speeds at 120 miles per hour, delivers 6000 hp with its three units.



G-E motors drive this wind tunnel fan. Right, air is pumped out of television receiver tubes.

New diesel-electrics for narrow-gage railroads were introduced, as was a high-speed haulage electric locomotive for the coal industry. More than 70 switching engines for industrial plants were delivered. The Company is developing for main-line railroad service an oil-burning gas-turbine electric locomotive.

New Appliances

Despite critical material shortages and sporadic production-line bottlenecks, the Appliance and Merchandise Department is turning out an increasingly steady stream of products to help meet the tremendous public demand for all types of General Electric appliances. Concentration on production in 1946 was on standard demand models, but even so it was possible to introduce several new models of appliances with popular-appeal improvements.

Among the new appliances is an automatic washing machine with positive automatic action through all cycles of soaking, washing, rinsing, and damp-drying. A new line of "space-making" refrigerators with a unique type of wrap-around all-steel cabinet construction was also introduced. New developments in the hermetically-sealed General Electric refrigerating unit made it possible to reduce its size, leaving more usable space in the refrigerator compartment. In one model, for example, there are two cubic feet of additional storage space. The Department also brought out two new home freezers.

The 1947 de luxe electric range has a built-in "three-in-one" thrift cooker, a cooker which can be used as a surface unit or for pressure and steam cooking. The new automatic dishwasher and a more efficient garbage unit (Disposall), are offered separately; or housed together in a porcelain-on-steel cabinet they become the completely automatic General Electric Sink. The Department also introduced a new two-control automatic electric blanket and a lightweight hand iron with "Visualizer" fabric temperature control, the control being mounted at the front of the handle for greater visibility and safety. The Department's full line also includes water heaters, home laundry equipment, vacuum cleaners, toasters, clocks, heating pads, waffle irons, heat lamps, fans, and construction materials such as wire and cable, switches, wiring devices, etc., for the building construction market.

Air Conditioning

By the end of the year nearly all types of products manufactured by the Air Conditioning Department before the war were back in production. The list was a long one, for the scope of the Air Conditioning Department activities covers nearly every phase of heating, refrigeration, and air conditioning—including oil and gas fired heating equipment, water coolers, beverage coolers and refrigerators, and air conditioning equipment for industrial, marine, residential, and commercial applications. Despite concentration on production, the output did not begin to satisfy demand.

Extensive retooling of factory facilities as well as new designs will enable the Department to increase substantially its volume of business with products having new features of compactness, reliability, and efficiency. For example, a new oil burner for furnace conversion with an over-all height of less than one foot was produced for warm air, hot water, and steam heating systems.

Probably the most important improvements in air conditioning were made in the condensing units. After nearly a year of rigorous field tests, the first models of a completely new line of small condensing units were announced for applications ranging from compact self-contained installations to those used for larger remote air conditioning and refrigeration.

Research, in spite of the emphasis on production, was not neglected in this field. Investigations continued into such air conditioning techniques as the "heat pump."

For the Nation's Health

Products manufactured by the General Electric X-Ray Corporation constitute a major contribution to the nation's health. The use of miniature-film x-ray units mounted in special buses has become more widespread, making it possible to "take x-ray to the people." Through mass surveys, health authorities believe it possible eventually to eradicate tuberculosis, for such surveys find the disease in its early and curable stage. State tuberculosis societies, state departments of health, and the United States Public Health Service have acquired buses equipped with these x-ray units. The need for mobility also has resulted in the manufacture of a special transportable unit which can be easily assembled or disassembled by two men.

During the year the X-Ray Corporation undertook distribution of the Pako automatic x-ray film processing machine, and the Berman locator, which facilitates by electronic means the finding of metal objects in the body. It improved a fixture for a germicidal ultraviolet lamp, and started production of a crystal-controlled inductotherm, which generates heat deep within the tissues.

In the Field of Plastics

General Electric continues to occupy a unique position in the plastics industry. It is the only company which is an important factor in every branch of plastics: manufacturer of plastics materials, molder of finished products, and manufacturer and fabricator of laminated plastics. The Company is the largest manufacturer of finished plastics parts in the world.

Developments included a heat-resistant plastic offering special characteristics for radar, television, and frequency-modulation radio sets as well as other high-frequency applications, and a phosphoasbestos material offering unusual fire-resistant characteristics. Material improvements in manufacturing procedures—including electronic preheating devices—have cut production time in half on such articles as plastic radio cabinets, lamp shades, and bases for electric toasters.

The Silicones

The silicone family, born of ordinary sea sand, was augmented by a new material known as silicone glass laminate. Silicone rubber, which retains its elastic properties at temperatures as low as −55 F and as high as 520 F, was applied as gaskets for baking ovens, conventional lighting fixtures, and diesel engines. Silicone oil attracted the attention of aircraft manufacturers as a hydraulic fluid because it flows readily at extremely low temperatures and is comparatively noninflammable.

The Company has augmented the sintered and cast alnico alloys by the nonmetallic mixture known as vectolite and by the ductile magnets known as cunife, cunico, and silmanal. This addition of permanent magnet materials has increased the use of magnets in radio and other communications systems, meters and instruments, motors, generators, control equipment, and magnetos. In the radio manufacturing industry, our alnico permanent magnets are being used extensively in loudspeakers, replacing the electromagnets formerly used. For meters and instruments the ductile alloys are providing a light-weight moving element. A new field for permanent magnetic materials also is being opened up by their use in new synchronous induction motors.

Electronics

Radios and radio-phonograph combinations are among the most important products of the Electronics Department. General Electric has introduced the Musaphonic line of de luxe two-speaker radio-phonographs in period-designed cabinets. These radios receive both standard and frequency modulation (FM) broadcasts. These instruments and also the Company's standard line of automatic combinations feature the electronic reproducer which provides a method of reproducing sound from records with freedom from needle scratch and "chatter." The tone arm, if dropped on records, does not damage them nor is the stylus itself damaged. The operating cost of a portable self-charging radio introduced in the year is estimated at one cent for 20 hours of playing time. The battery is re-charged while the radio is being played on an ordinary house circuit.

FM Broadcasting and Television

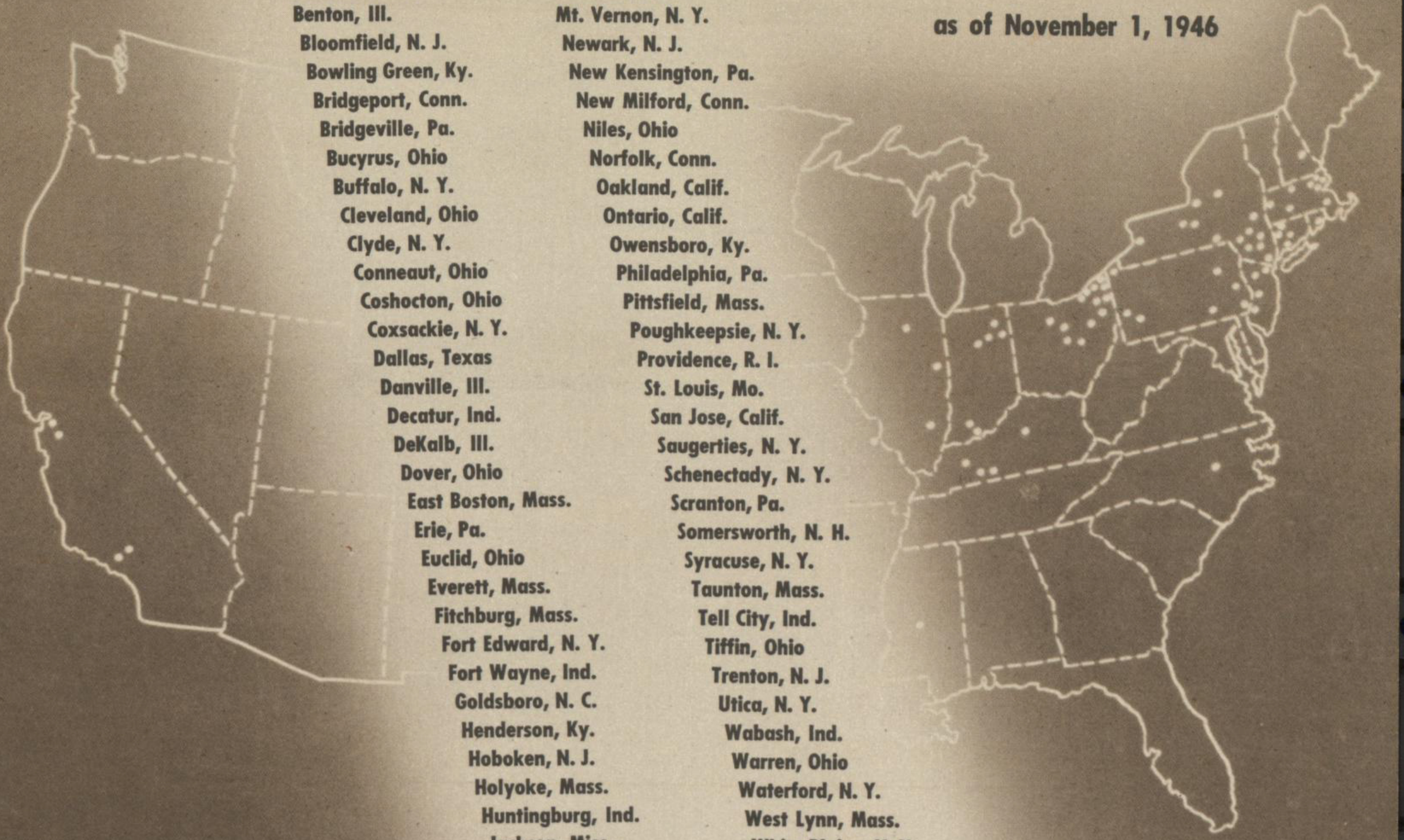
Three new television receivers were introduced. One is of the direct-view type producing a picture on the face of a 10-inch cathode-ray tube. This set also receives standard broadcast programs. The same size and type of tube is in a second model which provides both standard and FM broadcast reception and an automatic phonograph with the electronic reproducer. The third receiver is of the projection type and produces a picture on an 18 by 24-inch screen. This set also receives both high- and low-band FM broadcasts, standard and short-wave programs, and contains an automatic phonograph using the electronic reproducer.

Frequency modulation broadcasting and television continue to find increasing favor with the public, and several important advancements in each field were made. One outstanding electronic development was the phasitron tube which simplifies the generation and control of frequency modulated carriers in modern FM transmitters. Several transmitting tubes of advanced mechanical and electrical design have been developed for both FM and television broadcasting. In the power field, ignitron designs have been extended to higher power levels.

Radar is being developed to increase the safety of airplane travel. Air lines are already flying experimentally planes equipped with General Electric radar, and it is expected that many commercial planes will be so equipped within the next few years. Al-

GENERAL ELECTRIC

Location of Manufacturing Plants as of November 1, 1946



Allentown, Pa.
Anaheim, Calif.
Andover, Ohio
Bellevue, Ohio
Benton, Ill.
Bloomfield, N. J.
Bowling Green, Ky.
Bridgeport, Conn.
Bridgeville, Pa.
Bucyrus, Ohio
Buffalo, N. Y.
Cleveland, Ohio
Clyde, N. Y.
Conneaut, Ohio
Coshocton, Ohio
Coxsackie, N. Y.
Dallas, Texas
Danville, Ill.
Decatur, Ind.
DeKalb, Ill.
Dover, Ohio
East Boston, Mass.
Erie, Pa.
Euclid, Ohio
Everett, Mass.
Fitchburg, Mass.
Fort Edward, N. Y.
Fort Wayne, Ind.
Goldsboro, N. C.
Henderson, Ky.
Hoboken, N. J.
Holyoke, Mass.
Huntingburg, Ind.
Jackson, Miss.
Jefferson, Ohio
Kokomo, Ind.
Lexington, Ky.
Lowell, Mass.
Meriden, Conn.
Millerton, N. Y.
Mt. Vernon, N. Y.
Newark, N. J.
New Kensington, Pa.
New Milford, Conn.
Niles, Ohio
Norfolk, Conn.
Oakland, Calif.
Ontario, Calif.
Owensboro, Ky.
Philadelphia, Pa.
Pittsfield, Mass.
Poughkeepsie, N. Y.
Providence, R. I.
St. Louis, Mo.
San Jose, Calif.
Saugerties, N. Y.
Schenectady, N. Y.
Scranton, Pa.
Somersworth, N. H.
Syracuse, N. Y.
Taunton, Mass.
Tell City, Ind.
Tiffin, Ohio
Trenton, N. J.
Utica, N. Y.
Wabash, Ind.
Warren, Ohio
Waterford, N. Y.
West Lynn, Mass.
White Plains, N. Y.
York, Pa.
Youngstown, Ohio

As of November 1, 1946, the General Electric Company owned or leased for its own operations in the United States a total of 93 plants located in 72 cities in 16 states. This did not include plants under construction, plants operated for the government, or plants of affiliated companies.

though a completely integrated electronic traffic control and navigational system is still in the future, it is clear that many of the problems may be solved by supplementing existing equipment with additional electronic aids.

General Electric is constructing and will operate experimentally, subject to FCC approval, a microwave radio relay network from New York City to Schenectady. The network will serve as a television relay system. Tests will also be made to determine its feasibility as a carrier for FM radio programs, facsimile, and business machine circuits.

Industrial applications of high-frequency heating are expected to be numerous. The new tubes give power and frequency sufficient for heating almost any insulating body. Even quartz, for instance, can be melted in this way. Because the heat can be applied internally, applications in many cases will reduce production costs.

So You Will See Better

Improvements in the General Electric Lighting Institute at Nela Park, Cleveland, costing a quarter of a million dollars, were completed during the year, and the Institute was re-dedicated in September. The interior was re-designed in a manner appropriate to the phenomenal increase in the use of light (100 times the amount used 40 years ago) and to emphasize the systematic organization of knowledge for better vision through proper lighting.

In the Lamp Gallery—one of several exhibits—approximately 700 different lamps of the 10,000 varieties of lamps produced by the Company are on display, illustrating the uses of infrared lamps for home and industry, germicidal lamps for killing airborne bacteria, repeating flashtubes for photography, fluorescent lamps of all sizes, shapes, and colors, sunlamps, mercury and neon glow lamps, sodium lamps, and filament lamps ranging from the 0.17-watt "grain of wheat" light to the 50,000-watt lamp which is 35 inches high and 20 inches in diameter.

In a comprehensive test conducted by the Westchester County Department of Health, germicidal lamps were placed in schools, churches, and other public meeting places in Pleasantville, New York. Careful studies are being made on the effect of these lamps on the incidence and spread of contagious infections.

One of the most spectacular features of General Electric lighting in the year was the illumination of the Yankee Stadium, New York City, for night baseball. The three-and-one-half acre area was lighted to a level of 200 foot-candles, nearly twice that of any other baseball park, by the use of 1245 G-E floodlights.

The Lighting Institute at Nela Park, Cleveland, was re-designed and re-dedicated in 1946.